

## Amendment to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims

1. (Currently amended) A sensor ~~comprised of~~ comprising a sensor element, ~~wherein the sensor element comprises~~ comprising one or more sensing moieties and one or more signaling moieties, ~~and wherein the sensor element is not comprised in a cell,~~  
wherein the sensing moieties are polypeptides or polynucleotides,  
wherein the signaling moieties are polypeptides,  
wherein the sensing moieties, the signaling moieties, or both the sensing and signaling moieties are organized on a surface,  
~~wherein each sensing moiety~~ moieties ~~has one or more states indicative of a target analyte, one or more signaling moieties alone or in combination engenders the production of a detectable signal,~~  
wherein the state or a change in the state of one or more sensing moieties is transduced to one or more signaling ~~moieties~~ moieties, whereby one or more of the signaling ~~moieties~~ entities ~~alone or in combination engender production of a detectable signal,~~  
wherein the detectable signal is qualitatively or quantitatively indicative of one or more of:  
the absence of the target analyte below a threshold,  
the presence of the target analyte above a threshold ~~threshold,~~ or  
the amount of [[a]] the target analyte or of analyte,  
a change in the absence of the target analyte below a threshold,  
a change in the presence of target the analyte above a threshold ~~or~~  
threshold, or  
a change in the amount of [[a]] the target analyte, ~~and one or the other or both the sensing moiety and the signaling moiety is not a naturally occurring entity.~~
2. (Currently amended) A sensor according to claim 1 or 63 ~~claim 1,~~ wherein one or more

sensing moieties binds one or more target analytes indirectly but not directly.

3. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein one or more sensing moieties is comprised in a sensing module and one or more signaling moieties is comprised in a signaling module, wherein the sensing module can be operatively linked to different signaling modules and the signaling molecule can be operatively linked to different sensing modules.
4. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein production of the detectable signal engenders changes in the sensor element whereby production of the detectable signal is terminated and a change in binding of the one or more target analytes to one or more sensing moieties is required to again engender production of a detectable signal.
5. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, comprising
  - a first plurality of sensing moieties that directly or indirectly bind a first target analyte and
  - a second plurality of sensing moieties that directly or indirectly bind a second target analyte,
  - further comprising one or more first signaling moieties that engender production of a first detectable signal and
  - one or more second signaling moieties that engender production of a second detectable signal distinguishable from the first detectable signal,
  - wherein the first detectable signal is qualitatively or quantitatively indicative of one or more of:
    - the absence of the first target analyte below a threshold,
    - the presence of the first target analyte above a threshold, or
    - the amount of the first target analyte or of analyte,
    - a change in the absence of the first target analyte below a threshold,
    - a change in the presence of the first target analyte above a threshold, or
    - a change in the amount of the first target analyte, and
  - wherein the second detectable signal is qualitatively or quantitatively indicative of

one or more of:

the absence ~~of the second target analyte~~ below a threshold,  
the presence of the second target analyte above a threshold, ~~or~~  
the amount of the second target analyte ~~or of analyte,~~  
a change in the absence of the second target analyte below a threshold,  
a change in the presence of the second target analyte above a threshold, or  
a change in the amount of the second target analyte.

6. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, comprising
- a first plurality of first sensing moieties that directly or indirectly bind a first target analyte,
  - a second plurality of second sensing moieties that directly or indirectly bind a second target analyte, and
  - one or more signaling moieties that alone or in combination engender the production of a detectable signal,
- wherein production of the detectable signal is qualitatively or quantitatively indicative of one or more of:
- the absence of the first and the second target analytes in combination below a threshold,
  - the presence of the first and the second target analytes in combination above a ~~threshold or threshold,~~
  - the amount of the first and the second target analytes in ~~combination~~ combination, or is indicative of
  - a change in the absence of the first and the second target analytes in combination below a threshold,
  - a change in the presence of the first and the second target analytes in combination above a ~~threshold or threshold, or~~
  - a change in the amount of the first and second target analytes in combination.
7. (Original) A sensor according to claim 6, wherein the first and second target analytes contribute differently to the combination.

8. (Canceled)
9. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein one or more sensing moieties are partly or entirely the products of *in vitro* selection or directed evolution.
10. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein the state of one or more sensing moieties is transduced to one or more signaling entities, wherein the sensing moieties and the signaling moieties are in different molecules or multimolecular complexes.
- 11-27. (Canceled)
28. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein one or more sensing moieties are the sensing moiety is derived partly or entirely from the antigen binding site of an antibody, the binding site of a bacterial chemosensory receptor, or the ligand-binding site of a ligand binding receptor.
29. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein one or more sensing moieties are partly or entirely the products of *in vitro* selection or directed evolution.
- 30-31. (Canceled)
32. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein one or more sensing moieties comprise the sensing moiety comprises a four helix bundle receptor protein binding domain.
- 33-34. (Canceled)
35. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein the sensing moieties, and moieties and the signaling moieties, or both the sensing moieties and the signaling moieties are disposed operationally in a membrane.
- 36-53. (Canceled)

54. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein the detectable signal is selected from the group consisting of fluorescence, chemiluminescence, ~~phosphorescence, phosphorescence or~~ optical absorbence, ~~[[or]]~~ a change in fluorescence, a change in chemiluminescence, a change in phosphorescence, and a change in ~~[[or]]~~ optical absorbence.
- 55-57. (Canceled)
58. (Currently amended) A sensor according to claim 1 or 63~~claim 1~~, wherein the detectable signal is a change in the fluorescence intensity of an acceptor fluorophore of a donor-acceptor fluorescence energy transfer pair.
- 59-62. (Canceled)
63. (New) A sensor comprising a sensor element, wherein the sensor element comprises one or more sensing moieties and one or more signaling moieties,  
wherein the sensing moieties are polypeptides or polynucleotides,  
wherein the signaling moieties are polypeptides,  
wherein each sensing moiety has one or more states indicative of a target analyte,  
wherein the state or a change in the state of one or more sensing moieties is transduced to one or more signaling moieties, whereby one or more of the signaling moieties alone or in combination engender production of a detectable signal,  
wherein at least one signaling moiety comprises a methyl-accepting chemosensory receptor or a portion thereof,  
wherein the detectable signal is qualitatively or quantitatively indicative of one or more of:  
the absence of the target analyte below a threshold,  
the presence of the target analyte above a threshold,  
the amount of the target analyte,  
a change in the absence of the target analyte below a threshold,  
a change in the presence of target the analyte above a threshold, or  
a change in the amount of the target analyte.

64. (New) A sensor according to claim 1 or 63, wherein the surface is a two-dimensional surface array.
65. (New) A sensor according to claim 1 or 63, wherein the sensing moiety comprises a methyl chemosensory protein or a portion thereof.
66. (New) A sensor according to claim 1 or 63, wherein the signaling moiety comprises a cytoplasmic domain of the methyl-accepting chemosensory receptor.
68. (New) A sensor according to claim 63, wherein the sensor element is comprised in a cell.
69. (New) A sensor according to claim 68, wherein the cell is a bacterial cell.
70. (New) A sensor according to claim 69, wherein the bacterial cell is a chemosensory cell.
71. (New) A sensor according to claim 70, wherein the chemosensory cell comprises methyl-accepting chemosensory receptors.
72. (New) A sensor according to claim 63, wherein the methyl-accepting chemosensory receptor is a bacterial methyl-accepting chemosensory receptor.
73. (New) A sensor according to any one of claims 1 or 63, wherein the state of one or more sensing moieties is transduced to one or more signaling entities, wherein the sensing moieties and the signaling moieties are part of the same molecule or multimolecular complex.